Verify that this is the correct version before use

Compliance is Mandatory

Inspection and Testing

Responsible Office: Safety and Mission Assurance Directorate

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Change History Log

Revision	Date	Originator	Description of Changes
Baseline	July 2007	NT/Scott Henricks 281-483-0554	Initial Release. Previously numbered as SLP 4.10, converted to JPR numbering and template, and placed under control of the JSC Document Management System (JDMS)

P. PREFACE

P.1 PURPOSE

The purpose of this procedure is to provide a standardized method for the receiving, inspection, testing, and recording of test status requirements of products.

P.2 APPLICABILITY

This JPR is applicable to all JSC NASA organizations, Ellington Field Aircraft Operations, and the Sonny Carter Training Facility, except for the following:

a) White Sands Test Facility,
b) Office of Inspector General, and
c) NASA Safety Engineering Center.

JSC directives may apply to contractors or grant recipients only to the extent specified or referenced in the appropriate contracts, grants, or agreements.

P.3 AUTHORITY

JPD 1280.1, Quality Policy
JPR 1280.2, Quality Manual

P.4 APPLICABLE DOCUMENTS

NPR 8735.2, Management of Government Quality Assurance Functions for NASA Contracts
JPR 1281.1, Management Responsibility
JPR 1281.8, Product Identification and Traceability
JPR 1281.9, Process Control
JPR 1281.11, Control of Monitoring and Measuring Devices
JPR 1281.13, Control of Nonconforming Product
JPR 1281.17, J*SC Audits*
JPR 1440.3, JSC Files and Records Management Procedures
JSC 26549, Control of Program Stock
ANSI/ASQ Z1.4-2003, Sampling Procedures and Tables for Inspection by Attributes
NT-CWI-001, Task Performance Sheet (TPS)

P.5 MEASUREMENT/VERIFICATION

P.5.1 Processes and procedures shall be measured and monitored as prescribed by JPR 1281.9.

P.5.2 Audits, as prescribed in JPR 1281.17, shall be used to verify conformance with requirements.

P.5.3 Results shall be reviewed by Directorates and the Center as prescribed by JPR 1281.1.

P.6 CANCELLATION / RESCISSION

JSC System Level Procedure 4.10, Revision F, Dated October, 2006, *Inspection and Testing.*

Original Signed By:

H. Lawrence Dyer
Manager, Management Integration Office

Distribution:
JDMS

1.0 RESPONSIBILITIES

1.1 Product Engineering Function (PEF)

1.1.1 The PEF shall be responsible for documenting procedures for inspection and testing of a product at the stage of the product development process for which they are responsible. The documentation shall included suitable means by which the conformance or nonconformance status of a product is recorded and maintained.

1.1.2. This document shall include qualification requirements and/or first article inspections from the first production run of new products. The PEF is also responsible for identifying any Specific Inspection Points requiring secondary verification.

1.2 Quality Engineering Function (QEF)

1.2.1. The QEF shall be responsible for ensuring that inspection and test documentation contains adequate criteria for acceptance of products and for inspection and test performance per approved product Work Instructions (WIs). The QEF shall ensure inspection and test procedures contain verification methods that ensure the ability to inspect and test the product.

1.2.2. In cases when specific verification methods are not available, the QEF shall develop procedures and/or WIs that ensure the product can be inspected or tested to specified requirements.

1.2.3. The QEF is responsible for identifying Specific Inspection Points requiring secondary verification and shall include criteria for acceptance and/or rejection and a record of measured results.

1.3 Quality Assurance Function (QAF)

1.3.1 The QAF shall be responsible for performing inspection, making secondary verifications, and verifying testing as required by approved product WIs and for documenting results.

1.3.2 The QAF shall verify that the inspection and test status of the product is recorded and maintained throughout production, installation and servicing as required by product (WIs).

1.3.3 The QAF shall be responsible for verifying that the product is not released for further processing (used, installed, shipped, etc.) until it has PASSED the required inspections and tests, unless authorized for release per JPR 1281.13.

1.3.4 The QAF shall ensure acceptance authority media (e.g., stamps and electronic signatures) have established and documented controls.

1.4 Process Operator (PO)

1.4.1 The PO shall be responsible for ensuring that the inspection and test status of the product is recorded and maintained throughout production, installation and servicing as required by product WIs.
1.4.2 The PO shall perform self verifications and document the results as required by WIs.

1.4.3 The PO shall ensure that the product is not released for further processing (used, installed, shipped, etc.) until it has PASSED the required inspections and tests, unless authorized for release per JPR 1281.13.

1.5 Product Receiver (PR)

The PR shall be responsible for performing the initial logistical receiving inspection and/or testing of the product in accordance with approved product WIs.

2.0 PROCEDURE

2.1 General

2.1.1 The Product Engineering Function (PEF) shall develop and document inspection and test procedures to ensure that identification, inspection, test requirements, and traceability are satisfactorily met per approved product Work Instructions (WIs). This activity includes unique product traceability identifiers such as lot, batch, serial, and/or release numbers where traceability is a specified requirement. This activity will manage inspection and test status records per JPR 1440.3 and identify Specific Inspection Points requiring secondary verification.

2.1.2 The PEF shall perform validation of the test data in the material test reports (MTR) on a quarterly basis when purchasing of raw material utilizes MTRs for verification. The validation testing will be coordinated by the raw material owner and performed at the Receiving Inspection and Test Facility (RITF) or an equivalent laboratory. The performance of this testing must be verified by the cognizant quality organization or its delegate(s). Testing validation will include NASA-JSC and their contractors. MTR validation will be performed once per quarter on a random vendor. Vendors selected will be different for each quarter in a calendar year. Sample size will be determined in accordance with ANSI / ASQ Z1.4 for the population received from the selected vendor. Exotic materials, i.e., those where chemical analysis standards and/or physical and mechanical test properties are not easily available, readily defined, proprietary, and/or not available, will not require validation testing unless specified by the user. Records of test validation will be maintained as part of the receiving records data package.

2.1.3 The Quality Engineering Function (QEF) shall review and approve documented inspection and test procedures and WIs per approved product WIs and (optionally) identify Specific Inspection Points requiring secondary verification.

2.1.4 The QEF shall;

a. ensure inspection and test procedures contain verification methods that ensure the ability to inspect and test the product.

b. develop, when specific verification methods are not available, procedures and/or WIs that ensure the product can be inspected or tested to specified requirements.

c. verify, when independent product traceability verification is required, procedures that provide for traceability of all controlled JSC products are maintained from receipt and during all stages of, production, assembly, testing, delivery, and/or installation.

2.2 Receiving Inspection and Testing

2.2.1 The PEF and/or **QEF** shall determine the amount and nature of receiving inspection and testing required, taking into consideration the control exercised at the subcontractor's premises and the recorded evidence of conformance that is provided.

2.2.2 The Product Receiver (PR) shall perform initial logistical receiving inspection in accordance with approved product WIs and deliver the product to the designated storage area**.** Any non-conformances will be processed in accordance with approved procedures.

2.2.3 The Process Operator (PO) or **Quality Assurance Function (QAF)** shall perform detailed receiving inspection and testing per approved requirements. This activity includes identifying the configuration of the product in order to identify any differences between the actual configuration and the required configuration. When monitoring and measuring devices are required to perform inspection and testing, the device will be compliant to JPR 1281.11.

2.2.4 The PO or **QAF** shall process as a nonconformance any product that is released before the completion of receiving inspection and testing in accordance with JPR 1281.13.

2.2.5 The PO or **QAF** shall document results and release the product for further processing upon completion of detailed receiving inspection and testing.

2.3 In-Process Inspection and Testing

2.3.1 The PO shall transfer the product to its appropriate area and complete all product inspection and testing preparations in accordance with approved requirements.

2.3.2 The PO shall perform in-process self verification in accordance with approved product WIs, record results**,** and process non-conformances in accordance with JPR 1281.13.

2.3.3 The QAF shall perform secondary verification of Specified Inspection Points as required by the approved in-process inspection and testing product WIs and process non-

conformances in accordance with JPR 1281.13.

2.3.4 The PO or **QAF** shall process as a nonconformance any product that is released before the completion of all in-process inspection and testing in accordance with JPR 1281.13.

2.3.5 The PO shall hold the product until the required in-process inspection and testing has been completed and necessary data have been received.

2.3.6 The PO or **QAF** shall verify that in-process inspection and testing data satisfactorily meet specified requirements in accordance with approved product WIs.

2.3.7 The PO or **QAF** shall document results and release the product for further processing at the completion of all in-process inspection and testing in accordance with approved product WIs.

2.4 Final Inspection and Testing

2.4.1 The PO shall perform all final inspection and testing in accordance with approved product WIs to complete evidence of conformance of the finished product to the specified requirements**,** and process non-conformances per JPR 1281.13.

2.4.2 The QAF shall perform all secondary verification of Specified Inspections Points as required by the approved final inspection and testing product WIs to complete evidence of conformance of the finished product to the specified requirements**,** and process non-conformances per JPR 1281.13.

2.4.3 If any final inspection and testing has not been completed, the **PO** or **QAF** shall process the product, per JPR 1281.13, as if the product had failed a completed inspection and test until the JPR 1281.13 disposition process can be completed.

2.4.4 The PO or **QAF** shall review records for completeness, annotate final closure and process the Quality Records per JPR 1440.3.

2.4.5 The PO or **QAF** shall ensure that the product is not released for further processing until it has passed the required inspections and tests, unless authorized for release per JPR 1281.13. Release the conforming product.

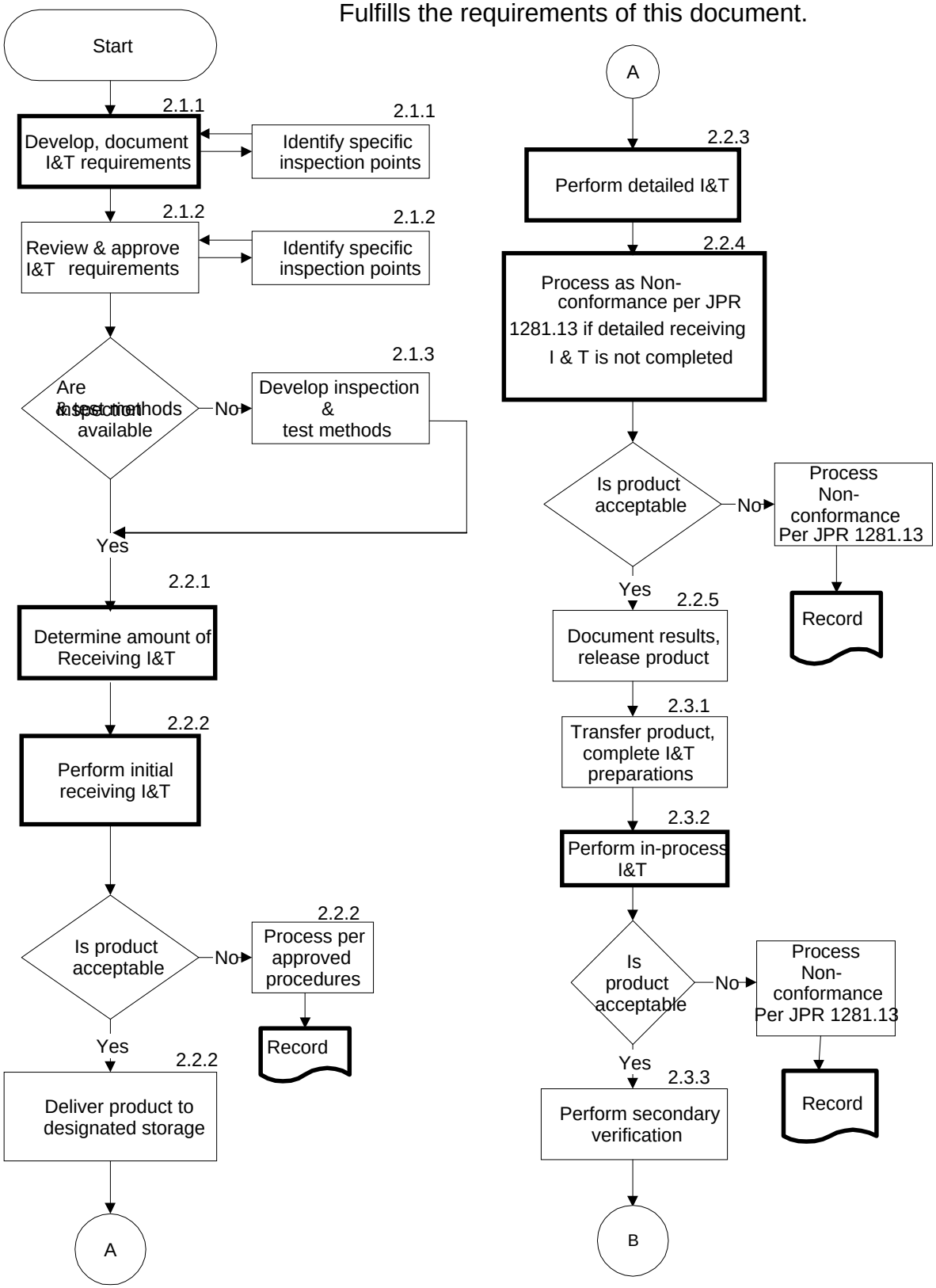
3.0 RECORDS AND FORMS

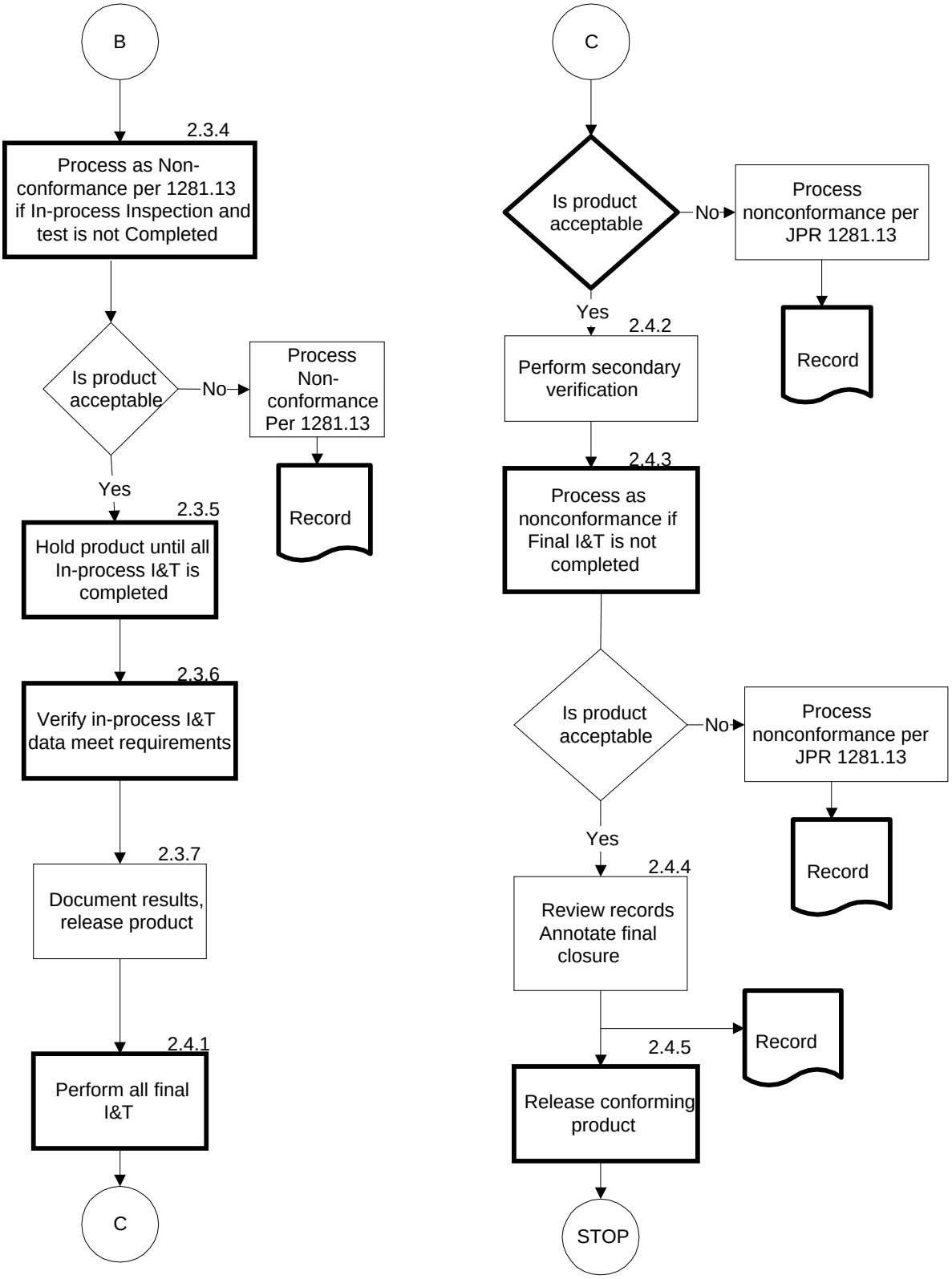
The Product Engineering Function shall retain applicable records, including:

- Positive Recall Records,
- Inspection and Test Records and/or Test Data, and
- Product Release Records.

FLOWCHARTS

Fulfills the requirements of this document.




B
2.3.4
Process as Non-conformance per 1281.13 if In-process Inspection and test is not Completed
Is product acceptable
No
Process Non-conformance Per 1281.13
Record
Yes
2.3.5
Hold product until all In-process I&T is completed
2.3.6
Verify in-process I&T data meet requirements
2.3.7
Document results, release product
2.4.1
Perform all final I&T
C
C
Is product acceptable
No
Process nonconformance per JPR 1281.13
Record
Yes
2.4.2
Perform secondary verification
2.4.3
Process as nonconformance if Final I&T is not completed
Is product acceptable
No
Process nonconformance per JPR 1281.13
Record
Yes
2.4.4
Review records Annotate final closure
Record
2.4.5
Release conforming product
STOP

APPENDIX A: TERMS AND DEFINITIONS

TERM	DEFINITION
Product	The results of activities or processes. A product may include a service, hardware, processed materials, software, or a combination thereof.
Inspection and testing	Activity such as measuring, examining, testing, or gauging one or more characteristics of a product and comparing the results with specified requirements in order to establish whether conformity is achieved for each characteristic.
Inspection and Test Status	Evidence of the conformance or nonconformance condition(s) of a product as a result of inspection and test.
Inspection and Test Status record	Work authorization documents, forms, tags, routers, labels, cards, and database records upon which the inspection and/or test status of a product is to be recorded. These records must indicate the authorized person who allowed the proper release of the product.
Receiving inspection and testing	Verification by inspection and/or test for proper identification, damage, parts count, condition, data package review, packaging, and any other receiving inspection and test criteria as required by the quality plan and/or documented procedures. Receiving inspections and tests are conducted in two phases - initial and detailed. **Initial receiving inspection and testing.** Phase one of logistical receiving inspection and testing, whereby all inbound freight is checked in. This phase of inspection and testing includes verifying type, count, and condition of the product per approved product work instructions (WIs). **Detailed receiving inspection and testing.** Phase two of receiving inspection and testing, whereby a more detailed level of inspection and testing is performed. The level of detail shall be documented as a requirement per approved product WIs.
In-process inspection and testing	A verification by inspection and/or testing of quality characteristics during the processing of a product as required by the quality plan and/or documented procedures.
Final inspection and testing	The verification that all specified inspections and tests, including those specified either on receipt of product or in process, have been carried out and that the results meet specified requirements as required by the quality plan and/or documented procedures.
Secondary verification	An independent verification of a product, by someone other than the one performing the task, to verify conformance to specified requirements.
Specific inspection point	An inspection point, during product processing, requiring secondary verification before the product can be processed further. These inspection points may be identified as mandatory inspection points (MIPs) and/or Government MIPs (GMIPs). (Reference NPR 8735.2 chapter 8) These inspection points include Physical and Functional Key Characteristics and other characteristics that are not key but are important to safe and successful

TERM	DEFINITION
	product development. (Reference JPR 1280.2 for more information on "key characteristics")
Equipment Classifications	**Class I equipment.** Equipment acceptable for space flight use. (Controlled flight equipment) **Class II equipment.** Equipment acceptable for use in ground tests or training in a hazardous environment. (Controlled non-flight equipment). **Class III equipment.** Equipment acceptable for non-hazardous training or display purposes. (Non-controlled non-flight equipment) **Class IIIW equipment.** Equipment acceptable for use in Water Immersion training in a hazardous environment. (Controlled non-flight equipment) **Ground Support Equipment (GSE).** Non-flight equipment designed and certified with a physical and/or functional interface with flight hardware that is required for the handling, servicing, inspection, testing, maintenance, alignment, adjustment, checkout, repair or overhaul of Class I or Class II products. (Controlled non-flight equipment) **Special Test Equipment/Devices (STE/D).** Special Test Equipment/Devices (STE/D). STE/D are similar in function to GSE but are not controlled until time of use. This equipment may be used in support of class I, II, IIIW and GSE checkout and service in limited cases. (Controlled non-flight equipment, see NT-CWI-001 for additional requirements). Note: Items with a flight part number cannot be classified as STE/D. **Non-flight equipment.** Equipment used to aid in the processing, maintaining, testing, repairing, etc., of the flight equipment and all its systems. Non-flight equipment is comprised of GSE, Class II, III, IIIW, commercial tools, special test equipment, special test devices, and element tools. (Non-controlled non-flight equipment)
Storage area	Any area designated for storing products, including any holding areas used for receiving, storage, and inspection.

APPENDIX B: SLP 4.10 CHANGE LOG

Rev.	Date	Originator	Description
Basic	03/06/97	Larry M. Starnes	Initial Release
A	08/13/97	Larry M. Starnes	Para. 3, References; change ND-QM-007 to ND-CWI-001. Para. 3, References; change SLP4.13-1 to SLP 4.13. Para. 5.7 Definitions; Add definitions of MIP and VIP. Appendix -A; delete JSC 521, replace with JSC 873; delete JSC 151 Detailed Test Procedures; Add JSC 881 - Subassembly Process Sheet
B	1/16/97	Larry M. Starnes	Sec. 2, Deleted the words "all" and "developed" from the scope. Sec. 3, added ND-CWI-002. Sec. 4, Deleted reference to Appendix A. Sec. 5.1, Clarified definition of product. Sec. 5.7.1 & 5.7.2, deleted definitions. Sec. 6.4 delete self inspections and testing and add self verification. Sec. 6.5, added additional responsibilities to PO. Flow chart, deleted Quality Record requirement at block 7.1.3. Sec. 7.3.2, delete self inspection and testing and add self verification. Delete all of Appendix A.
C	12/02/98	Larry M. Starnes	Sec. 7.4.3, clarified para.
D	12/08/00	Larry M. Starnes	Sec. 2, Revise Scope Sec. 3, Correct CWI reference Sec. 4, Add Product Release Records Sec. 6.3, Add responsibility for releasing conforming products Sec. 6.4, Add responsibility for releasing conforming product.
E	07/31/06	Scott S. Henricks	Re-wrote to combine SLP 4.8, SLP 4.12, and to reflect AS 9100 requirements.
F	10/31/06	Scott S. Henricks	Removed SLP 4.8 information. Sec. 5.12 added to address key characteristics.